

WHAT IS CLAIMED IS:

1. A switch device operable in two steps, the switch device comprising:

5 a first switch;

a second switch;

a button, inclinable in a first direction and a second direction, for activating the first and/or second switch, the button being inclinable to a first operation position  
10 and a second operation position when inclined in the first direction and being inclinable to a third operation position and a fourth operation position when inclined in the second direction; and

a pusher arranged between the button and the first and  
15 second switches, the pusher being movable when the button is pushed, wherein

inclination of the button in the first direction to the first operation position moves the pusher to solely activate the first switch;

20 further inclination of the button in the first direction to the second operation position moves the pusher to activate the second switch in addition to the first switch;

25 inclination of the button in the second direction to the third operation position moves the pusher to solely activate the second switch; and

further inclination of the button in the second direction to the fourth operation position moves the pusher to activate the first switch in addition to the  
30 second switch.

2. The switch device according to claim 1, wherein the pusher includes a first switch operator, facing towards

the first switch, for activating the first switch, and a second switch operator, facing towards the second switch, for activating the second switch.

5           3.    The switch device according to claim 2, wherein the pusher further includes a first extension and a second extension respectively arranged opposite the first and second switch operators, the switch device further comprising:

10           a switch body for supporting the button in an inclinable manner and for accommodating the pusher, the switch body including a first receiving portion for contacting the first extension of the pusher when the button is inclined in the first direction and a second receiving  
15           portion for contacting the second extension of the pusher when the button is inclined in the second direction, wherein

              the button includes a first pushing portion for pushing a first portion located at a first extension side of a top of the pusher and a second pushing  
20           portion for pushing a second portion located at a second extension side of the top of the pusher; and

              the pusher is moved about a position of contact between the first extension and the first receiving portion when the button is inclined from the first  
25           operation position to the second operation position to activate the second switch, and the pusher is moved about a position of contact between the second extension and the second receiving portion when the button is inclined from the third operation position to  
30           the fourth operation position to activate the first switch.

4.    A switch device operable in two steps, the switch

device comprising:

a first switch including a first fixed contact and a first movable contact associated with the first fixed contact;

5 a second switch including a second fixed contact and a second movable contact associated with the second fixed contact;

a pusher movably arranged on the first and second movable contacts, the pusher including a first switch operator, arranged in association with the first movable contact, for activating the first switch and a second switch operator, arranged in association with the second movable contact, for activating the second switch; and

15 a button including a first pushing portion for pushing a first portion located at a top of the pusher in correspondence with the first switch and a second pushing portion for pushing a second portion located at the top of the pusher in correspondence with the second switch, the button being inclinable in a first direction to push the pusher with the first pushing portion and being inclinable in a second direction to push the pusher with the second pushing portion, the button being inclinable to a first operation position and a second operation position when inclined in the first direction and being inclinable to a third operation position and a fourth operation position when inclined in the second direction, wherein

inclination of the button in the first direction to the first operation position moves the pusher and solely activates the first switch with the first switch operator;

30 further inclination of the button in the first direction to the second operation position further moves the pusher and activates the second switch with

the second switch operator in addition to the first switch;

inclination of the button in the second direction to the third operation position moves the pusher and solely activates the second switch with the second switch operator; and

further inclination of the button in the second direction to the fourth operation position further moves the pusher and activates the first switch with the first switch operator in addition to the second switch.

5. The switch device according to claim 4, wherein the pusher further includes a first extension and a second extension respectively arranged opposite the first and second switch operators, the switch device further comprising:

a switch body for supporting the button in an inclinable manner and for accommodating the pusher, the switch body including a first receiving portion for contacting the first extension of the pusher when the button is inclined in the first direction and a second receiving portion for contacting the second extension of the pusher when the button is inclined in the second direction,

wherein the pusher is moved about a position of contact between the first extension and the first receiving portion when the button is inclined from the first operation position to the second operation position to activate the second switch, and the pusher is moved about a position of contact between the second extension and the second receiving portion when the button is inclined from the third operation position to the fourth operation position to activate the first switch.

6. The switch device according to claim 5, wherein the first receiving portion includes a first receiving surface for receiving the first extension at a generally right angle, and the second receiving portion includes a second receiving surface for receiving the second extension at a generally right angle.

7. The switch device according to claim 4, wherein the load required for activating the first switch is substantially equal to the load required for activating the second switch.

8. The switch device according to claim 4, wherein the first switch includes a resiliently deformable first dome having a concave surface, and the second switch includes a resiliently deformable second dome having a convex surface, the first movable contact being arranged on the concave surface of the first dome, and the second movable contact being arranged on the concave surface of the second dome.

9. The switch device according to claim 8, wherein the first dome and the second dome have substantially the same shape and size.

10. The switch device according to claim 4, wherein the pusher has a shape that is substantially symmetrical about its centerline, and the first and second pushing portions of the button push the pusher at positions equally spaced from the centerline of the pusher.

11. A switch device operable in two steps, the switch

device comprising:

a first switch;

a second switch;

a pusher movably arranged on the first and second  
5 switches, the pusher including a first switch operator,  
arranged in association with the first switch, for  
activating the first switch, a second switch operator,  
arranged in association with the second switch, for  
activating the second switch, and a first extension and a  
10 second extension respectively arranged opposite the first  
and second switch operators;

a switch body for accommodating the pusher, the switch  
body including a first receiving portion for contacting the  
first extension of the pusher and a second receiving portion  
15 for contacting the second extension of the pusher; and

a button supported by the switch body in an inclinable  
manner, the button including a first pushing portion for  
pushing a first portion located at a top of the pusher in  
correspondence with the first switch and a second pushing  
20 portion for pushing a second portion located at the top of  
the pusher in correspondence with the second switch, the  
button being inclinable in a first direction to push the  
pusher with the first pushing portion and being inclinable  
in a second direction to push the pusher with the second  
25 pushing portion, the button being inclinable to a first  
operation position and a second operation position when  
inclined in the first direction and being inclinable to a  
third operation position and a fourth operation position  
when inclined in the second direction, wherein  
30 inclination of the button in the first direction  
to the first operation position moves the pusher and  
solely activates the first switch with the first switch  
operator;

further inclination of the button in the first direction to the second operation position further moves the pusher about a position of contact between the first extension and the first receiving portion to activate the second switch with the second switch operator in addition to the first switch;

inclination of the button in the second direction to the third operation position moves the pusher and solely activates the second switch with the second switch operator; and

further inclination of the button in the second direction to the fourth operation position further moves the pusher about a position of contact between the second extension and the second receiving portion to activate the first switch with the first switch operator in addition to the second switch.

12. A vehicle window drive apparatus for opening and closing a vehicle window, the vehicle window drive apparatus comprising:

a switch device operated to open and close the vehicle window, the switch device including;

a first switch including a first fixed contact and a first movable contact associated with the first fixed contact;

a second switch including a second fixed contact and a second movable contact associated with the second fixed contact;

a pusher movably arranged on the first and second movable contacts, the pusher including a first switch operator, arranged in association with the first movable contact, for activating the first switch and a second switch operator, arranged in association with

the second movable contact, for activating the second switch; and

5 a button including a first pushing portion for pushing a first portion located at a top of the pusher in correspondence with the first switch and a second pushing portion for pushing a second portion located at the top of the pusher in correspondence with the second switch, the button being inclinable in a first direction to push the pusher with the first pushing  
10 portion and being inclinable in a second direction to push the pusher with the second pushing portion, the button being inclinable to a first operation position and a second operation position when inclined in the first direction and being inclinable to a third  
15 operation position and a fourth operation position when inclined in the second direction, wherein

inclination of the button in the first direction to the first operation position moves the pusher and solely activates the first switch with the first switch  
20 operator to keep the window moving in an opening direction as long as the first switch remains activated;

further inclination of the button in the first direction to the second operation position further  
25 moves the pusher and activates the second switch with the second switch operator in addition to the first switch to completely open the window;

inclination of the button in the second direction to the third operation position moves the pusher and  
30 solely activates the second switch with the second switch operator to keep the window moving in a closing direction as long as the second switch remains activated; and



5 further inclination of the button in the second direction to the fourth operation position further moves the pusher and activates the first switch with the first switch operator in addition to the second switch to completely close the window.